COST *and* MANAGEMENT

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COST AND MANAGEMENT

Some Mathematical Formulae For Depreciation

By H. TATE, M.A., B.Sc.,
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(Before Montreal Chapter, November 8, 1928.)

NO material article will last forever; machines wear out with use, they wear out when not in use or may even have to be replaced while still in good working order on account of improvements in design or the introduction of new inventions. Now the coal consumed and the tool used in making an article (when this tool lasts only a few months) are properly considered an expense of production and charged against it for that year. Similarly if our unit of time were the entire life of a machine (which may last for many years) we should, of course, charge the cost of this machine against the production for the same time. By dividing our time into arbitrary units of 1 year each, the problem is to devise some equitable method of charging the cost of the machine used. If we carried the machine at its original price on the books until it was worn out, there would be a loss at the end of the last year equal to the difference between this price and the scrap value, and profits for that year would be greatly reduced, while these

NOTICE OF ANNUAL MEETING

The Annual Meeting of the Canadian Society of Cost Accountants will be held on Thursday, March 28, 1929, at 8 p.m., in the Board of Trade Rooms, Royal Bank Bldg., Toronto, Can.

G. C. LEROUX,
Hon. Secretary.

W. A. McKAGUE,
Exec. Secretary.

for the previous years would have been correspondingly increased. It is to equalize this loss and spread it over the life of the machine that is the purpose of the methods for dealing with depreciation.

From the date of installation until the machine becomes unfit to perform profitably the work for which it was purchased and must then be discarded, the value of the machine diminishes from its original value to the scrap value. This decrease in value is called depreciation. We may, therefore, define depreciations as the decrease in the value of an asset due to such causes as wear and tear, age, inadequacy, obsolescence, etc. It ought to be noted that depreciation is purely financial and ought not to be confused with deterioration—which is physical. The latter may be, and is, one of the causes of the former, but is not identical with it. As we mentioned above, unless some provision is made periodically for this loss, the business will suffer a sudden loss of capital: such provision is either made by writing down the book value of the asset every year or by the formation of a special reserve. The relative merits of these methods are, of course, matters for the judgment of the accountant. In order to calculate the depreciation, we must then know:—

(a) the life of the asset
(b) the original cost
(c) the scrap value
(d) some method for spreading the depreciation over the life of the article.

Different Methods Used

We shall consider here only a few of the many methods proposed for dealing with this problem.
They are:—

(1) The "straight line" method.
(2) The "constant percentage of book value" method.
(3) The method based on the sum of the years of life.
(4) The "sinking fund" method.
(5) The "unit cost" method.

We shall take a machine costing $2,500 having a scrap value of $500, and a service life of 5 years, and work out the Book Values, etc., by each of the foregoing methods.

(1) *The Straight Line Method*

This method writes down the Book Value from $2,500 to $500 over 5 years by writing off a constant amount each year or a constant percentage of the original cost.

Clearly the amount to be written off each year is

$$\frac{\$2,500-500}{5}=\$400 \text{ or } 16\% \text{ of } \$2,500$$

(2) *The Constant Percentage of Book Value Method*

Values are reduced by writing off a fixed percentage at the end of each year of the Book Value at the beginning of that year.

If r is the percentage to be written off each year, we have

$$2,500\ (1-r)^5=500$$

$$(1-r)^5=\frac{1}{5}=.2$$

$$\therefore\ 1-r/100=\sqrt[5]{.2}$$

In finding the value of r we use logarithms and get r=27% approximately.

(3) *Method based on the sum of the years of life*

The sum of the years of life=5+4+3+2+1=15 and we write off 5/15, 4/15, 3/15, 2/15 and 1/15 respectively of the difference between $2,500 and $500 (i.e., $2,000), each year.

(4) *Sinking Fund Method*

This replaces the original cost of the machine at the end of its life by depositing each year, maybe in sound securities outside the business, such a sum as will reach the amount desired.

Now $2,000 is the amount desired,
and if R is the annual deposit, we get

$$R=\frac{2000}{\overline{s}_{\overline{5}|}}\ \text{at } 5\% \text{ say}$$

$$=\$362$$

(5) *The Unit Cost Method*

None of the previous methods have taken into account the question of obsolescence. By this method the old machine is so valued each year that the net cost of each unit of output, taking into account charges for repairs, operating, interest and depreciation should be the same as for a new machine. The depreciation is usually calculated by the sinking fund method.

Let C and c be the values of a new and old machine.
N and n be the lives of a new and old machine.
X and x the annual depreciation of a new and old machine.
O and o the annual operating expenses of a new and old machine.
R and r the annual repairs of a new and old machine.
Y and y the number of units of output of a new and old machine.

Then the cost of each unit of output for each of the old and new machines is

$$\frac{o+r+x+ci}{y} \quad \text{and} \quad \frac{O+R+X+Ci}{Y}$$

where i is the rate of interest.

Since the cost of each unit of output is supposed to be the same, we can equate these and solve the equation for c, which gives us the value of the old machine.

(For further information see the Transactions of the American Society of Civil Engineers, Dec., 1917)

A few tables showing the progress in Book Values by the methods 1 to 4 are appended.

1.

Year	Bk. Value	Annual Depreciation	Total Depreciation
0	2,500	.....	.....
1	2,100	400	400
2	1,700	400	800
3	1,300	400	1,200
4	900	400	1,600
5	500	400	2,000

2.

Year	Bk. Value	27% Annual Depreciation	Total Depreciation
0	2,500	.....	.....
1	1,825	675	675
2	1,332	493	1,168
3	972	360	1,528
4	710	262	1,790
5	508	192	1,982

Here the number 27 is only approximate, which accounts for the discrepancy of $9 in $508.

3. Year	2,000 Fraction of	Annual Depreciation	Book Value
0	0	.....	2,500
1	5/15	667	1,833
2	4/15	533	1,300
3	3/15	400	900
4	2/15	266	634
5	1/15	133	501

4. Yr.	Bk. Value	Annual Deposit	5% Interest	Annual Deposit + Interest	Total
0	2,500	.....	.....	.....	.....
1	2,138	362	10	362	362
2	1,758	362	18	380	742
3	1,359	362	37	399	1,141
4	940	362	57	419	1,560
5	500	362	78	440	2,000

A few remarks on the foregoing methods may not be out of place.

Their Relative Advantages

The straight line method has the great advantage of simplicity for no special or technical knowledge is required to perform the calculations. The method may be used either on a yearly basis or on the basis of working hours. Owing to the avoidance of interest the annual amount written off is too large and again, too, with increasing repairs towards the latter end of the life of the machine, the total annual burden increases. If it is desired to equalize this burden the method appears unsuitable. However, as any assumption as to depreciation is largely guesswork, this method may approach actual conditions as nearly as any other. On account of its simplicity the method has generally found favour with accountants.

The second method is useful when it is desired to write off heavy depreciation during the early years and with increasing repairs the total burden tends to be more evenly distributed. When once the rate has been calculated it will also apply to new additions and for this reason it has some advantages when aplied to factory plant and equipment. However, it is doubtful if a new business could afford such heavy depreciation charges during the early years. If the term is long the charges during the later years are ridicu-

lously low. With a scrap value of nothing the method fails entirely, for then the value of r is 100% no matter what the life is and the whole depreciation is written off during the first year. To avoid this the scrap value is sometimes given a nominal value of a dollar or so, but this does not really obviate the difficulty. It may be added that when the method is used in practice the rate is often merely a guess and usually far too small.

The main argument for the third method is that the results agree roughly with those of the second and therefore the same criticisms apply to this.

The fourth method is used when it is desired to accumulate a fund to replace an article when it is worn out. The deposits may be invested in outside securities or even in the business itself. The annual deposit plus interest increases yearly and if the term is long this sum may be very much greater towards the end than at the beginning; with increasing repairs the burden is still further increased. The method is sometimes used by Public Utility Companies.

In the fifth method X and x are assumed to be the whole sinking fund burden each year. This is not so, for we are ignoring the interest which may be considerable. The introduction of interest on the value is of doubtful validity. The net profits of the business already comprise (1) interest on the investment, at, say, 4%—the return given by gilt-edged securities, and, (2) an extra payment for the risks of enterprise. There is thus a duplication of the interest charge which appears unnecessary. It makes the depreciation charge also depend on the interest assumed which is rather a large assumption. The method is extremely complicated and it is very doubtful if it will ever be widely adopted, and also fails entirely when $y=0$; i.e. when the machine is idle.

Indeed it would appear that satisfactory methods will not be evolved until the age of invention is past!

The Scope and Functional Value of Time Studies

By H. F. WILSON

Wilson & Fessenden, Production Engineers, Kitchener, Ont.

(Before Hamilton Chapter, November 28, 1928.)

AT the outset of my remarks to you this evening, I wish to express my appreciation of this opportunity of addressing you on a subject which is intimately related to the fundamental objects of your Society, but at the same time, to many of you perhaps, is a phase of modern control, which has not yet fully taken its place in the industrial life of this country.

I had the pleasure of attending one of your General Conventions in Toronto a year or two ago, and also addressing the Toronto Chapter of your Society, and it is always a pleasure to me to make what contribution I can to the proceedings of your Society.

In speaking to you on this subject, perhaps it would not be out of place if I were to explain for a moment our right to discuss this subject.

As production engineers, we are fundamentally concerned with the control of production costs, and methods, and in such work it is essential to make extensive and constant use of time studies, and, therefore, in view of our experience in many industries, we feel that this phase of industrial management is becoming increasingly important.

During the last fifteen or twenty years a process of almost unnoticed industrial revolution has been at work in modern industry, and this evolution of methods and ideas has caused industrialists, more than ever, to explore and probe into all the available information concerning the materials—the forces—the methods of industrial production, involving, of course, the study of transportation both to, in and from the production unit. This new, or revitalizing process in industrial life has evidenced itself in the establishment of research departments in individual industries, in research foundations of all sorts, and in a general and open-minded spirit of logical enquiry into the reason for things.

Importance of the Worker

In addition to this researching into materials, forces and methods, industry is gradually adopting a new conception of the vast importance of what the workers think about their work, and about the companies they are working for. After all, the spirit of the men employed in an industry is of incalculable importance, and, like many other great movements in history, fundamental changes take place in the mass-consciousness of people long before they are actually recognized as definite forces.

For some reason or other, in the New World the average man has a better style of living than many of his fellows in the older countries of Europe.

Let us for a moment analyze our industrial life, and see what some of the causes are which have brought about this spirit of research. I think that no one will question the fact that the wealth of natural resources in the New World have made us all want many things. The spirit of democracy and freedom from traditional viewpoints has had the effect, in these new countries, of making every man want, in some measure, the things which other men have. The fact that thousands and thousands of men in these new countries have been able to acquire wealth and security, from the most humble beginnings, has created in the minds of most people the feeling that this country owes them certain things in life, in a modified degree, which the more fortunate individuals have in a greater measure.

Maintaining High Standards

It seems to me that this is fundamentally the cause of the raised standard of living in this country.

In order to satisfy these desires, we have been forced to re-search our whole industrial system, in order to produce things more efficiently than those peoples where low standards of living and low wages are the custom and consequence of the viewpoint of the people, and the depleted natural resources of their native country.

These causes have also brought into conscious evolution the theory of increasing the purchasing power of the producer by better wages, which is made possible by lower production costs.

These generalizations, however, cannot be expected to apply universally to every industry, and I would like to

quote you a few general figures which, I believe, are thought provoking:—

A survey in 1927, by the National Industrial Conference Board, which was sponsored by Mr. Hoover, showed that since 1914:

National output has increased 43% in essential commodities with 30% less wage earners

Value of production per man hour. 1919-1925.

Steel	50%	increase
Autos	125%	increase
Paper	25%	increase
Cement	55%	increase
Boots and Shoes	0	increase

Some industries have declined.

The question arises—if these are facts in industry, what about mine, and these facts are the combined pictures of myriads of small efforts.

To-day many an individual business is an industry by means of the stimulus of new ideas, by the elimination of waste in either materials or human effort, and by a logical control of its activities, based on a knowledge of facts, is able to manufacture at lower costs than the average in its group. Such businesses which produce more cheaply without making any of the saving by cutting the weekly pay envelope of the individual workman, are rendering a real service to the progress of industry."

Undoubtedly the industry which has shown very little production progress has failed to re-search its business.

All of this vast increase in productivity has been the source of our new wealth-creating industries, such as the manufacture of radios, aeroplanes, iceless refrigerators, automobiles, and so on.

It is interesting to note that Premier Stanley Baldwin of Great Britain, gives another name to this evolution, and calls it the "rationalization of industry."

The Objects in View

Now in the re-search of a business, we are trying to better and control:—

(1) *Materials*—As an example of what has been done along this line, let us mention a few instances:
The cracking of crude petroleum.

The development of new metal alloys.
The lengthened life of automobile tires.
The commercial development of artificial silks, and many other instances.

(2) *Forces*—The development of hydro power in our own country.
The investigation of the enlarged possibilities of the telephone, wireless and television.
The extended development of new types of internal combustion engines.

(3) *Methods*—There are hundreds of common instances, such as the development of the combine harvester.
Thousands of instances of the extended use of automatic machinery.
The chain assembly idea, and so forth.

(4) *The Viewpoint of the Workers*—By the development of a consciousness that the workman is an interested factor in a business.
The comparative freedom from labour troubles as results.
This is due undoubtedly to more intelligent and equitable management and to a sense of community of interests in the enterprise.

Where Costs Come In

Now in the question to be specifically discussed, we are concerned with the scope and functional value of time studies, and in this great movement of research one of the useful tools that may be used is the time study of operations. The first essential in any business is to know costs, to know what they will be to-day, and also to-morrow. In many businesses the accurate knowledge of costs is frequently lacking. It is comparatively easy to measure materials, to allow for waste, and to calculate overheads however they may be applied, but it is frequently difficult to accurately pre-determine labour costs. The most frequent slippage in estimating costs is undoubtedly in labour, and one of the functions of Time Studies is to arrive at reliable methods by which these elusive costs may be known.

Let us examine just what an experienced Time Study Engineer comes in contact with in a typical study.

He wishes to study, let us say, a certain operation in a manufacturing plant, so he goes out into the heart of this

industrial machine, and he meets the man who actually does the work; he also necessarily comes in contact with the foreman and superintendent. He sees how the materials are supplied to the operator. He sees the condition of the machine being operated. He gets to know by intimate contact the ideas and views of the workman.

He cannot help see, if he is a capable man, the waste of material, the waste of time, the excellence or incapacity of the management, as evidenced by the way things progress in the plant. He sees all kinds of things which hinder economical operations covering the materials, the working conditions, the men themselves, their equipment, their incentives and the management. If the department be a complicated one, it may necessitate continuous observation over several weeks, or even months, to slowly evolve better methods either of manufacture, utilization of time and materials or improved management facilities.

Now if such an observer has intelligence and brings this to bear on what his own eyes see, he sees more of the intimate mechanism of that business by being at its very heart, than the owner of the business, who may have been running it for years. It is again, the specialization of effort. Such an observer has absolutely nothing else to think of but the improvement of the job he is looking at. He isn't worrying about sales, orders, credits, designs, accounting, banks or anything else, but the one idea, "What can we do with this single thing, the improvement of this one job."

If anyone of us here given a flair for observation, and with intelligence and ingenuity were to concentrate and focus one's whole powers on one part of a business, it is quite logical to expect that progress could be expected.

If one operation even represents the thousandth part of an industry and substantial betterments can be effected in many of these units all through the industry, a very considerable final result will be attained.

Functions of the Time Study

The function, therefore, of a trained Time Study Engineer is:—

(1) To study the materials in use and their fitness for the job.

(2) To study the tools, machines and equipment with which the work is done.

(3) To study the position and relativity of these producing units to other units, as to convenience of operation.

(4) To observe the handling of the flow of product and its transportation to and from the producing unit.

(5) To observe the working conditions of the operator, light, air, ventilation, unnecessary fatigue conditions, and so on.

(6) To observe the managerial facilities which should ensure smooth operations of the producing unit, such as foreman service, mechanical service, tool-room service, knowledge of succeeding jobs in advance, etc.

(7) To see what the operator's viewpoint is; does he think he is simply a separate entity in the business, or does he feel that he is really a party of an organization, and that better wages and the development of improvements ensure the success of the concern he works for, and at the same time the permanence of his job.

All these things the efficient Time Study Engineer must observe, but observation is only the beginning. To develop an equitable and suitable method of wage payment for the job so that it will run smoothly requires the improvement of conditions surrounding the job. This involves selling the idea to the foreman and convincing the management of the economic advisability of any necessary changes. Not infrequently the management itself is ultra-conservative and lags in brisk action. All of the above calls for tact, enthusiasm, and the necessary energy and drive to get things carried through in spite of difficulties.

Setting Wage Rates

Once having established standard methods, materials, supply and conditions, the stage is set for the actual rate setting studies and rates.

These rates may take the form of straight piece rates, bonus or premium rates in some form, or, if necessary, even rates comprised of several factors covering waste, time, quality, etc. Sometimes rates should not be set on a time basis at all. For instance: Where the potential material wastage value greatly exceeds the labour value. Sometimes, for instance, with highly expensive equipment, the output of which is very precious, actual labour cost is a small factor, and less prominent in importance than out-

put, and in such cases special rates of different characters are desirable.

The functions of suitable wage incentives are, of course:—

(1) To stimulate maximum output and consequent lower unit burden costs, and lower direct labour costs.

(2) To stabilize labour cost figures and consequently run the business on knowledge rather than hope.

(3) To enable the payment of attractive wage rates which will reduce labour turnover and consequent training costs.

(4) To increase sales by enabling the manufacturer to sell goods for less money than his class group and still make a profit.

In all of these functions profits are the incidental outcome of the rendering of better products, a better service both to the buying public and to that section of the public who themselves produce the product.

Results That May be Attained

The personality of the successful Time Study Engineer must exemplify a few plain virtues, and the management who expect miraculous results must be prepared for some obstacles in the upward path of progress in their industry. There is no pot of gold at the end of the rainbow, but the sunshine increases as the steep upward path is painfully climbed. Bald truth is imperative, for the corrupting influence of compliment lies in the fact that the less one deserves it the more one enjoys it.

Every piece of industrial research is an expedition into the unknown and a combat against ignorance, folly and neglect, where not only front line men but also strategists are essential.

I have tried to show you in this talk that functional value of time study does not merely lie in the comparatively simple practice of finding out the time in which a job is done, but covers a very much broader field, and that a thoroughly experienced man with strong ability along these lines is an exceedingly valuable factor in the industry.

I do not know of any function in an industry where a man gains a more intimate contact in the producing heart of the business than through an intelligent study of the operations. In the vast majority of businesses a superin-

tendent or a manager is expected to cover so many functions that his efforts are spread out very thin, and the result is that the cultivation of the field results in surface cultivation largely, and if one examines the cause of an outstanding success in any one business in a group of industries producing the same goods, it will be found that in such a successful business there is deep and intensive cultivation of the industrial field, which is responsible for the outstanding financial success of such an industry.

There is no question, I believe, that specialized, intensive work on any one phase of the business, will produce quite remarkable results, and there is no more profitable field in which strenuous effort may be applied than in the intensive re-search of each operation.

Scheme of Subdivision For Statements

By PROF. R. R. THOMPSON, M.C., V.D., A.C.A., C.A.,

McGill, University, Montreal

(Summary of address given before Toronto Chapter, January 23, and before Hamilton Chapter, January 24.)

WHEN arranging for the financing of a concern, those responsible must first consider:—

(a) The total investment necessary to carry on its operations.

This sum may be found partially from capital supplied by the owners (partners or shareholders), and partially from money borrowed (loans made, bonds or debentures issued). This total sum is often referred to as the "Capitalization." It may be necessary to increase it later, and this may be done by the owners supplying further capital, more money being borrowed, or profits being retained in the business. All sums coming under these three categories form the "Capitalization." If any capital has been lost, it will be deducted from this figure, and the result will be the "Net Capitalization."

The concern will be formed to carry on operations of a certain type, or a business of a definite class. This is the regular business of the concern. The type and class may be plural.

(b) Those responsible must consider at regular intervals the results of carrying on their regular business with their capitalization. They must know the net profit or net loss earned by the capitalization in the regular business.

(c) They must know how this net profit or loss is decreased or increased by the payment of interest for those portions of the capitalization, which have been borrowed, by profits and losses which are extraneous to the regular business and so on.

(d) They must know how the final net increase or net decrease for the period will be disposed of.

(e) They must have a statement which indicates how the concern stands financially at the close of each period—the Balance Sheet.

The accompanying scheme is intended to provide for the above.

SCHEME OF SUBDIVISION FOR MANUFACTURING, TRADING, PROFIT AND LOSS AND OTHER STA

Under Review	Name of Statement; based on Ledger A/c of same name, unless stated otherwise	Principal Object of Statement	PRINCIPAL Main Items, Etc.
Factory in Operation, also Operations of Department Purchasing Raw Material.	Manufacturing, based on Work-in-Process, or Work-in-Progress Account or Accounts.	To show cost of Goods Finished or of Jobs or Contracts completed.	(A) Opening Inventories of Work-in-P (B) Direct Materials put into Proc (C) Direct Wages. (D) Direct Expenses. (E) Factory Overheads: Variable E (F) Factory Overheads: Stand
Result of Operations of Sales and Shipping Depts., also Operations of Department Purchasing Finished Goods.	Trading, or Gross Profit or Selling.	To show difference between Cost of Goods Sold and the Proceeds of Sales as made by the Sales Department and carried through by the Shipping Department; that is to say, the Gross Profit on Trading.	(G) Opening Inventories of Finishe (H) Cost of Goods Finished, etc. chases of Finished Goods. (I) Inward Freight and Purchases Goods. (J) Duty on Purchases of Finis (K) Other direct costs of Acquisitio chases of Finished Goods. (L) Return of Sales. (M) Rebates and Allowances on Damaged Goods. (N) Outward Freight on Sales, been covered by special Selling Price. (C.I.F. a F. quotations) (O) Gross Profit.
Internal Administration by Chief Executive, Managing Director, Partners as Managers, etc., and their Officers. **Cost of running various departments, other than the Factory, and Expenses and Charges controlled by those departments.**	**General Operating (Section of the Profit and Loss A/c if no special General Operating A/c).**	**To show what the "Net Capitalization" has earned in carrying on the business, for which the concern was formed.**	(P) Warehousing. (Q) Selling: Direct Exp. (R) Selling: Shipping, Deliver (S) Administrative and General. (T) Financial Management Expens controlled by (but not of th such as: Cash Discounts on Sales, Collection Costs, Losses on Exchange, Bad Debts. (U) Special losses and expenses, bu with the Replacement Business, s (i) Closing-down Expens tory. (ii) Loss due to heavy, s expected permane in investment Values. (V) Net Profit from Regular Busi by "Net Capitalization."
Cost of Financial Administration of Concern for which Owners or Directors are responsible.	**Net Income (Section of the Profit and Loss A/c if no special Net Income A/c).**	**To show the net increase or decrease to Proprietorship or Net Worth of the concern, for the period, as a result of all revenue operations, whether of the Regular Business or otherwise.**	(W) Net Loss from Regular Busi (X) Charges for "Capitalization" been raised on long: (i) Interest on Bonds bentures. (ii) Interest on long-term (Y) Losses from operations o Regular Business. (Z) Net Income for Period.
Shareholders' or Owners' Return for their Investment. **Financing for Future Out of Profits.**	**Revenue Surplus or Appropriation.**	**Disposal of Net Income or Total Loss for Period.**	(AA) Total Loss for Period. (BB) Appropriations over Los ing to prior per (CC) Appropriations to General and serves of Profits. (DD) Interest on Partners' Capital. (EE) Dividends or Transfers to Par rent A/cs. (FF) Transfers to Partners' Capita

SCHEME OF SUBDIVISION

LOSS AND OTHER STATEMENTS INTENDED TO SHOW THE HISTORY OF A CONCERN FOR A PERIOD

PRINCIPAL DEBITS		PRINCIPAL CREDITS	
Main Headings, Etc.	Comments	Main Headings	Comments
ing Inventory Work-in-Process. t Material into Process. t Wages. t Expense. ry Overhead Variable Ex. ry Overhead: Standing.		(1) Cost of Goods Finished or of Jobs and Contracts completed. (2) Closing Inventory Work-in-Process.	Item (2) can be shown as a deduction from Total Debits.
ng Inventory Finished Goods. of Goods Used, etc., or Purs of Finished Goods. d Freight Purchases of Finished on Purchase of Finished Goods. direct cost of acquisition for Purs of Finished Goods. n of Sales es and Allowances on Sales for ged Goods. rd Freight on Sales, which has covered by special increase in Price. (F.O.B., C.I.F. and C. and tations.) Profit.	Items (I), (J) and (K) should be shown as additions to (H) Purchases. Items (L), (M) and (N) should be shown as deductions from item (3).	(3) Gross Credit Sales. (4) Cash Sales. (5) Returns of Purchases. (6) Rebates and Allowances on Purchases for Damaged Goods etc.	Items (5) and (6) should be shown as deductions from Item (H).
ousing. : Direct Labor. : Shipping and Delivery. istrative and General. ial Management Expenses, Charges led by (a) of the concern. : h Discounts on Sales, llection Costs, ses or Errors, d Debts. losses and expenses, but connected e Regular Business, such as: Closing-up Expenses of Factory Loss due to heavy, sudden, unexpected and permanent drop in inventory Values. fit from Regular Business earned t Capitation."	Items coming under (T) are expenses and charges of the Regular Business. Items (8) and (9) can be shown as deductions from (T). It is important that Items (T), (8) and (9) should not be confused with capital interest charges, as they will indicate the efficiency of those responsible for Cash Collections, Granting of Credit, Internal Finance, etc.	(7) Gross Profit. (8) Cash Discounts on Purchases. (9) Profits on Exchange. (10) Income from Investments, which are held principally to secure a controlling interest in other businesses, so that the profits from the Regular Business of this concern can be enhanced by that controlling power. (11) Net Loss from Regular Business.	Items (8) and (9) can be shown as deductions from (T). Item (10) cannot be dissociated from the Regular Business, under the circumstances outlined.
s from Regular Business. for "Capitalization" which has sed on hand.: Interest on Bonds and Debentures. Interest on long-term Loans. from sections outside the Business. ome for the Period.		(12) Net Profit from Regular Business. (13) Income from Investments, the holding of which has nothing to do with the Regular Business. If these investments are sold it will not affect the profit earning capacity of other Regular Business. (14) Profits from Operations outside the Regular Business. (15) Total Loss for the Period.	
ss for the Period. ations for Losses belonging to prior periods. ations to General and other Reserves. Profits. on hand to Capital. s or Drawings to Partners' Current. to Partners' Capitals.		(16) Net Income for Period. (17) Profits belonging to prior periods. (18) Interest on Partners' Overdrawings. (19) Transfers to Capital (as directed by Owners, etc.). (20) Transfers to Partners' Current Accounts.	

Application of Standard Costs

By ARTHUR D. PRATT
President, Pratt Poster Co., Indianapolis

(From the "Typothetae Bulletin.")

THE typical printer is pictured as a creature to whom any semblance of system is extremely distasteful. He is so busily engaged in doing the multifarious chores that go to make up the day's work around a print shop, such as cutting stock, estimating and paring down said estimates, receiving ink men, and chasing down the wherewithal for the elusive payroll, that he simply has no time to give to the consideration of a system designed to bring order out of chaos, to remove estimating from the realm of conjecture, and to show him the way to a real profit instead of drawing down a smaller wage than he pays his journeymen, as is true, alas, in many cases.

My portrait of a typical printer, it may be urged, is a reflection of the "gay nineties," but here in 1928 it still remains a fair likeness, and the poster printer has his place in the picture.

The poster printing business (not being a Rotarian, I have refrained from terming it a "game" is a slap-dash, high pressure affair where orders for printing rush madly in by telegram, special delivery and long distance. This "service" stuff so fondly described in the advertisements, if any, of our friends in the commercial job line means nothing in a poster printer's life. He gets the work in and he gets it out the same day, and that's how he stays in business.

In a shop of this nature the very rapidity of the pace maintained may cause the proprietor, not to mention the men, to look askance at any suggestion of orderly procedure, systematic timekeeping, all the appalling (at first sight) paraphernalia that goes to make up complete cost finding.

"Oh, that stuff would never work in our plant," he is apt to say. "It takes too much time, the men wouldn't stand for it. Besides (as a happy afterthought) we sell from a list and can't get any more for our stuff."

It is true that the poster printer does sell in part at least from a price list. The half sheet, the full sheet, three, six, eight and up are fairly standard pieces, as are half-sheet cards, full sheet cards, dates and assorted sizes of herald. These familiar items in the poster printing routine show only minor variations in process of production and a price list representing the average experience of many poster plants is available and may be employed with a fair degree of safety.

However, it goes without saying that no price list can take the place of accurate knowledge of conditions in one's own plant. As a matter of fact, the printer without a cost system is apt to regard any price schedule as extremely high, one on which he could make plenty of money, providing he could get away with those prices.

Cost System Shows up Prices

A group of tariff printers got together several years ago in an effort to work out a uniform page rate schedule as applied to the middle west and southern points. All the printers without cost systems regarded the rate advocated as entirely out of line. They asserted that their railroad customers would never pay such rates. As most of the cost system printers present were already on a schedule only slightly lower than the one projected, there were grounds for an argument even hotter than those marking any assembly of printers. They argued two days in sweltering July weather and got exactly nowhere. There was no agreement, no price betterment, and the printers who fought the contemplated rate were the only ones who needed it.

Now, going back to the poster printer, his greater volume lies in fairly well standardized work, as printing goes, and he sells it from a list, so he is likely to feel that a cost system would be excess baggage for him. Still the time may come when he begins to wonder where the profits he is supposed to be making actually are; he may listen to a printer friend who is a Typothetan; a survey of his town may show profits at a ridiculously low percentage. In short, he may not be entirely impervious to new ideas and will become a convert, though possibly a lukewarm one, to the cost system.

The sledding is tough at first; the detail seems endless; men object to new forms, and both the office and

factory forces evidently regard the system as "more bother than it's worth." A new order of things is not received with open arms in the printing business, and the cost system is no exception to the rule.

Become Used to System

Still they struggle along with it, and before long it becomes routine, part of the day's work. The first monthly summary is taken off and the boss' education has begun. Willy-nilly he is commencing to find out *facts* about his own business, among them that hand composition cannot ever be sold for $2.50, frequently not for $3.50, and sometimes not for $4.00 or $4.50.

Another thing he finds out is that *average* prices cannot always apply to a *particular* shop, that what can be sold in other shops at a profit is being produced in his own at a loss. He didn't dream of this before, and, naturally, he starts investigating. (That is another thing a cost system does to you; you become an investigator second only to Sherlock Holmes.) So he corrects the condition, or raises his prices, something that can be done when one is a specialist, without cutting off all of one's business. Therefore it is all the more important that a printing specialist know his costs so that he may know when and why to adjust them.

And so ere long this convert to cost discovers that the system is doing really remarkable things for his business. Not only have his profits increased, but the spur has been applied to lagging production, and working conditions throughout his plant have been bettered, for system is a foe to disorder and slovenliness. Best of all, the man *knows* his own business, a satisfaction that is as deep as that bestowed by added profits, and what, I ask you, could be deeper?

The cost system is, of course, only the A B C's of Typothetae whose advantages, possibilities for business, education and printing betterment are innumerable and cannot be dwelt on here. The cost system, though, with its direct appeal to the pocketbook, is the entering wedge, and if a man avails himself of nothing else than this, he will, without a single, solitary doubt, find it the best investment he ever made or could hope to make, a very cornerstone upon which he may erect a business edifice that will endure.

The Cost of Keeping Equipment

By ROBERT E. O'CONNOR

President, J. C. O'Connor & Sons, Fort Wayne, Indiana

(An address at the 9th annual meeting of the Associated General Contractors of America. Reprinted in part from "The Constructor.")

WHEN a person is sick, the usual and sensible thing to do is to go to a doctor who, after an examination, finding the symptoms, prescribes for him—not any old medicine that may be purchased, but most likely a remedy recorded and proven, given to the world of medicine as the work and thought of many of the best minds in the profession, altered perhaps by the doctor to fit the needs of the particular patient.

So it is through law, the arts, all professions, every line of endeavour, practice based on records of proven procedure, facts developed throughout years of effort by many minds, facts used, fitted and adjusted for varying conditions but always firmly founded.

Contractors in their business have also the benefit of like records of procedure, information of positive worth prepared with labour and expense by men of just as high repute as those in any other business or profession. These men have placed at our disposal the medicine we need for a business that is sick. If we use it, we could be made well.

The prescription for a cure of the disease called "lack of proper equipment costs" one can find in the construction equipment schedule of the A. G. C. of A., taken with proper doses of study from any one of many books on the subject and a poultice of real brain work applied to our business.

We know the answer of the contractors. They say, "That's the bunk." Why, if a fellow charged equipment expense according to that schedule, he never would get work! In other words, the schedule and records may be correct in every detail, we should worry about that. Our interest is only in having a job and to get it we just bid without knowing or caring about the costs entering into it.

Common Sense

We contractors speak of common sense and pride ourselves on our possession of it. I desire to quote from "Common Sense, How to Exercise It" by Yoritomo-Tashi: "To those who possess common sense is given the faculty of placing everything in its proper rank. It does not underestimate the value of sentiments by attributing to them an exaggerated importance. It permits us to consider fictitious reasons with reservation and of absolutely rejecting those that resort to weapons of hypocrisy.

"Persons who cultivate common sense never refuse to admit their errors. One may truly affirm that they are rarely far from the truth because they practise directness of thought and force themselves never to deviate from this mental attitude.

"Common sense is the art of resolving questions, not the art of posing them. When taking the initiative, it is rarely on trial. But the moment it is a case of applying practically that which ingenuity, science or genius has invented, it intervenes in the happiest and most decisive manner.

"Common sense is the principal element of discernment. Therefore, without this quality it is impossible to judge either of the proposition or the importance of the subject. It is only with the aid of common sense that it is possible to distinguish the exact nature of the proposition submitted for a just appreciation and to render a solution of it which conforms to perfect accuracy of interpretation. Without accuracy, common sense can not be satisfied, and without reason there can be no common sense.

"To reason about a thing is to dissect it, to examine it from every point of view before adopting it, before deferring to it, or before rejecting it. In one word, to reason about a thing is to act with conscious volition, which is one of the phases essential to common sense."

Some Contractors' Views

Does any man believe that, judged from our own business conduct, we would be credited with possessing it? To those contractors who are so hard to impress with the importance of equipment costs, for no other reason apparently than that they own their equipment, we desire to submit

some statements taken from letters sent to us by concerns whose business is the buying, rebuilding, renting and selling of equipment.

"Our basis of figuring for the rental or use of equipment could be approached by our method of pricing rebuilt equipment for rental purposes. We have to charge 10% of the valuation of a piece of rebuilt equipment or our selling price of same per month. This because of the fact our rentals are for short periods and very rarely run longer than three months.

"As perhaps you know, the top price for which we can sell rebuilt equipment is 66 2/3% of the new selling price, which would make the rental price figure approximately 6 2/3% of the manufacturer's price on this class of equipment.

"We have not followed or tried to rent a great deal of road builders' equipment owing to the fact that there have been so many radical changes in the sizes and improvements on road construction equipment that it is practically impossible for us to keep up with the procession. On road construction work, this matter should be taken into consideration also by the contractor in basing his charges against the equipment being used on the job.

"We all know that even if the equipment will be standard and there will not be a change of specifications, every piece of machinery used in the construction of roads depreciates 33 1/3% as soon as it is put on the job. This is caused by the difference between the expense of manufacturing any piece of equipment and the selling price, including selling, advertising, commissions to salesmen or agents and his salary, stocking repair parts and other items too numerous to mention which go to make up this difference of 33 1/3%.

"If you should happen to buy, we would say, a 27-E paver for spring work and the State's specifications would change and it would be necessary to use a 32-E, then the depreciation mounts rapidly in proportion to the number of places left where a 27-E paver could be used. This, of course, applies on the locomotives, batch boxes, batch box cars and bins. It would be quite a hard proposition for anyone to figure out depreciation or a fair allowance to be charged against the equipment in use.

"Another point which should be taken into consideration is the rehabilitation of the piece of machinery when it is through with the job and will have to be put in condition for use on another job. The cost of this rehabilitation work usually amounts to one-sixth of the value of the machine. This, of course, we have proven by our own rebuilding methods. It is possible for a contractor to repair a machine and put it in usable condition for, we would say, one-eighth of the new value, but this is about as close as you could figure.

"It is quite possible that we will go into the rental of road construction equipment as soon as the states and the manufacturers settle on a standard machine or machines which can be used."

Readily Understood

Certainly these contractors can understand that the charge placed in their estimates to cover equipment cost can be reasonably close to what it would cost to use rented equipment in place of their own. If they cannot reason that out, we are wasting our time.

We have been asked to state what we consider a proper equipment cost for Indiana state work and will do so for the items of excavation and slab, taking an eight-mile project on which to submit the figures, even though it is above the average of work done by an outfit on state work in one season. Basing decisions on the following conditions and circumstances as being connected with the job.

Standard Indiana State Specifications to govern. No special provision or clause requiring anything exceptional or unreasonable insofar as the equipment requirements are concerned; however, specifying a definite time limit for completion.

No right-of-way trouble.

Time of award, March 1st.

Contractor to start work by May 1st. Complete slab October 1st. Whole project, December 1st.

Truck job.

Excavation on job, 80,000 yards.

Slab on job, 84,480 square yards.

Dead haul, 2 miles off centre of road, 4 miles live, average 4 miles.

Water, centre of road.

All other conditions ideal, enabling (if weather is average season) completion within time limit.

New equipment figured for job, allowed by contractor, average life grading equipment 4 5/9 years, paving equipment 4 years.

As per A. G. C. of A. schedule.

Excavation charge for equipment, $.1705; value of equipment, $28,770.

Paving charge for equipment, $.8353; value of equipment, $104,082.

Paving without trucks, $.2556; value of equipment, $26,032.

Truck cost per square yard, $.5797; value of equipment, $64,750.

Figured according to our experience with like equipment, the cost would be:

Per cubic yard of excavation, $.125.

Per square yard of paving, $.17.

Trucks per square yard of paving, $.33-4.

Total for paving, $.50 per square yard.

The thought that the above statements will bring into the minds of the informed is that somebody is wrong, and terribly so, but on examination what are the facts?

First, the equipment schedule rather than being wrong, may be correct, since it is a statement compiled and based on conditions naturally not ideal, because that would be unsound reasoning and defeat its purpose. It is, on the other hand, a statement of rates for the classes and kinds of equipment set out that will serve under vastly different conditions of service. The limit for the worst, and from experience I can say not too high in that case, to be adjusted, taken as it were, fitted, added to or deducted from by contractors to meet each and every condition from the worst to the best, according to what these are in the doing of the work to which the equipment is to be applied.

Variations in Cost

As an example of one cause for variation in the trucking cost, it is interesting to consider the effect of purchase price and quality of truck on the charge for equipment on

that item. The truck figured in all prices as stated was taken as costing $5,444. This truck, charged at the experience rate, has a reduction of $.25 a square yard under the unit as figured by the equipment schedule, but that is not strange when under the experience record one can take 5 years of life for it instead of 3 years for all trucks as covered by the A. G. C. of A. schedule.

What if you considered some make or type of truck, cheap to the danger point, unfitted for the service, and purchased without rhyme or reason. Do you think the schedule rate as set out for auto trucks would be an overcharge on it?

It was with a feeling of hesitation that any specific costs were set out in this paper; no value can possibly be placed on such a statement other than to use it as an example by way of comparison, and again, in calling attention to the various important factors entering into equipment cost to properly arrive at it. Each job of highway work must be considered as an individual job, every particular condition to be met in the actual construction of it, as well as regulating clauses in the specifications taken into account; certain standards for repairs, operation, etc., must be decided upon, remembering—and though it comes last, perhaps it should be first—that quality and ability to perform, not price, is the essential thing in equipment to enable one to be reasonably sure of a proper equipment cost; that purchase in haste means usually repent at leisure.

And I almost forgot,—when you arrive at the proper cost, be sure and add it into the bid!

PERSONAL MENTION

Walter W. Rathie & Co., chartered accountants, Montreal, announce the admission to partnership of Wm. T. Woodall, C.A., and W. Harold Wilton, C.A., and that business will be continued under the firm name of Rathie, Woodall & Wilton, chartered accountants, with offices at 415-416 Transportation Building. Mr. Woodall is a member of the C.S.C.A., and we wish to extend our congratulations.

M. I. Long, C.A. (Clarke, Houston & Co.), has moved from 809 Canadian Bank of Commerce Chambers to 513 Pigott Bldg., Hamilton. Mr. Long is the well known secretary-treasurer of our Hamilton Chapter. The Pigott Construction Company, Ltd., which is responsible for Hamilton's newest sky-scraper, is represented in our Society by a new member, Richard A. Land.

Strikes and Lockouts in Canada

THE feature of the industrial disputes record for Canada in 1928 was the prevalence of strikes and lockouts of short duration and of those involving small numbers of employees, 39 out of the 101 disputes in existence during the year being of less than five days with 62 disputes under 15 days, while 65 disputes involved less than 100 employees. The number of disputes was, therefore, greater than in 1927 with the number of employees less, while the time loss in man working days was greater than in 1927, a protracted strike of coal miners in Alberta with two shorter disputes causing a time loss one-third of the total for the year. Another important feature of the year was the large number of strikes in the building trades, which also caused about one-third of the total time loss for the year.

Record of Strikes and Lockouts by Years

	Number of disputes		Disputes in existence in the year		
Year	In existence in the year	Beginning in the year	Employers involved	Workers involved	Time loss in working days
1901	104	104	273	28,086	632,311
1902	121	121	420	12,264	120,940
1903	146	146	927	50,041	1,226,500
1904	99	99	575	16,482	265,004
1905	89	88	437	16,223	217,244
1906	141	141	1,015	26,050	359,797
1907	149	144	825	36,224	621,962
1908	68	65	175	25,293	708,285
1909	69	69	397	17,332	871,845
1910	84	82	1,335	21,280	718,635
1911	99	96	475	30,094	2,046,650
1912	150	148	989	40,511	1,099,208
1913	113	106	1,015	39,536	1,287,678
1914	44	40	205	8,678	430,054
1915	43	38	96	9,140	106,149
1916	75	74	271	21,157	208,277
1917	148	141	714	48,329	1,134,970
1918	196	191	766	68,489	763,341
1919	298	290	1,913	138,988	3,942,189
1920	285	272	1,273	52,150	886,754
1921	145	138	907	22,930	956,461
1922	85	70	569	41,050	1,975,276
1923	91	77	419	32,868	768,494
1924	73	63	415	32,494	1,770,825
1925	83	81	510	25,796	1,743,996
1926	77	73	598	24,142	296,811
1927	79	72	652	22,683	165,288
1928	101	97	726	18,239	238,132
Total	3,255*	3,126	18,892*	926,549*	25,563,076

*In these totals figures for disputes extending over the end of a year are counted for more than once.

Since its establishment toward the end of 1900 the Department of Labour has maintained a record of strikes and lockouts in Canada, published in the "Labour Gazette" each month a complete list of those in progress, so far as available, with particulars as to the nature and result of each dispute. Early in each year a review of the previous year has been given, including statistical tables analyzing the data, since 1912 including a complete list of the disputes on record during the year. As the monthly statements in the "Labour Gazette" are necessarily of a preliminary nature the annual review constitutes the revised record for the year. A special report on "Strikes and Lockouts in Canada 1901 to 1912," issued in 1913, contained a complete list of strikes and lockouts for that period with analytical tables and the annual reviews in the "Labour Gazettte" have brought the lists of disputes and analytical tables down to date each year.

The record of the Department includes lockouts as well as strikes, but a lockout, or an industrial condition which is undoubtedly a lockout, is rarely encountered. In the statistical tables, therefore, strikes and lockouts are recorded together, the term dispute being used with reference to either.

A strike or lockout included as such in the records of the Department, is a cessation of work involving six or more employees and lasting one working day or more. Disputes of less than one day's duration and disputes involving less than six employees have not been included in the published record unless a time loss of 10 days or more is caused. A separate record of such disputes involving less than 10 days' time loss is maintained in the Department. During 1928 there were seven such disputes, involving 101 employees, making a time loss of twenty-six and one-half working days.

The figures in this report are inclusive of all disputes which come to the knowledge of the Department, and the methods taken to secure information practically preclude probability of omissions of a serious nature. So far as concerns figures given with respect to duration of strikes, numbers of employees concerned, etc., it is impossible always to secure exact information, but the estimate made in such cases is the result of painstaking methods in the collection of data, and, with increasing experience in dealing

with the subject it is believed that the statistics indicate the conditions with reasonable precision. The estimate of time loss is reached by multiplying the number of working days during which each strike lasted by the number of employees involved in the dispute from time to time so far as known. The numbers of employees recorded for each dispute is the number of those directly affected that is on strike or locked out and does not include those indirectly affected.

NEW MEMBERS

The following are new members of the Society:

Toronto Chapter

*Putt, W. F., Steel Company of Canada, Ltd. (Swansea Works), Toronto.
Lister, E. H., Page-Hersey Tubes, Ltd., Toronto.
Johnston, C. M., Beardmore & Co., Ltd., Toronto.
Bradshaw, M. A., Canadian Wm. A. Rogers, Ltd., Toronto.
*Parkhill, James A., Canadian Wm. A. Rogers, Ltd., Toronto.

Montreal Chapter

*Green, Percy G., Northern Electric Co., Westmount, Montreal.
Dobell, Sydney H., C.A., Clarkson, McDonald, Currie & Co., Montreal.

Hamilton Chapter

Land, Richard A., Pigott Construction Co., Ltd., Hamilton.
Nelson, S. B., Jr., Machinery & Equipment, Ltd., Hamilton.
Kendall, John A., National Steel Car Corp., Ltd., Hamilton.
Farnam, H. J., National Steel Car Corp., Ltd., Hamilton.
Horton, K. M. (in place of J. E. Goudy), Cosmos Imperial Mills, Ltd., Hamilton.

Winnipeg Chapter

*Wilton, R. W., W. L. McKenzie & Co., Winnipeg.
*Henderson, A. F., The Western King Mfg. Co., Winnipeg.

London, Ont.

Cook, John T., Scott & McHale, Ltd., London.

Regina, Sask.

Williams, E. J., C.A., George A. Touche & Co., Regina.

* Junior Membership.

Accountants Assist Federal Judge in Bankruptcy Examinations

An item in the Bulletin of the American Institute of Accountants states that public accountants will occupy the bench with Judge William Clark, of the United States district court at Newark, N.J., in

the weekly examinations of applicants for discharges in bankruptcy during the next few months. Judge Clark solicited the assistance of accountants in combatting abuses of the bankruptcy laws and his request was presented to the Society of Certified Public Accountants of the State of New Jersey.

As prompt action was necessary, members of the board of trustees were requested to volunteer their services in an advisory capacity, and arrangements were made to have the first examination with an accountant present on January 21st.

The innovation is declared to be a marked success. The accountant by examining books and accounts presented and by suggesting questions concerning administration of the petitioners' affairs, is able to facilitate the disclosure of information bearing directly on the good faith and validity of a petition for discharge.

The Trend of Production Costs

Though commodity prices, on the average, show a slight decline for the past few months, these changes have not affected production costs except in a few lines of manufacture. With skilled labour rather scarce, and interest rates keeping high for both short and long term loans, production costs as a whole cannot be said to be going down.

Index numbers of commodity prices compare as follows:

	Jan. 1928	Dec. 1928	Jan. 1929
Vegetable products	95.2	86.5	87.4
Animals and their products	106.9	109.1	106.4
Fibres, textile, etc.	94.5	93.2	93.2
Wood, wood products and paper	98.4	98.3	97.9
Iron and its products	93.7	93.0	93.3
Non-ferrous metals and their products	89.9	92.3	93.6
Non-metallic minerals and their products	93.8	94.4	94.4
Chemicals and allied products	96.9	94.3	94.4
All commodities	96.9	94.5	94.5

These index numbers are percentages of prices in 1926.

Some of the more important declines of recent months have been in fruits and vegetables, live stock, hides and skins, meats and poultry, newsprint, and sulphuric acid. Advances have taken place in furs, cotton, cast iron pipe, brass, copper and glass.

As regards labour, there has been very little disturbance. At the end of December there were eight strikes and lockouts in existence in Canada. Four of these were terminated in January, and four others commenced. At the end of January the strikes and lockouts were as follows: Tie cutters, Onion Lake, Ont.; coal miners, Wayne, Alta.; two disputes involving clothing factory workers at Toronto; textile factory workers, Hamilton; photo engravers, Toronto; photo engravers, Vancouver, and plumbers in Kingston.

CHAPTER NOTES

TORONTO

Toronto Chapter's meetings in February were of outstanding interest. On the 6th, A. Thormalen, industrial engineer, of Durant Motors of Canada, Ltd., Leaside, described "Plant Engineering and Its Relation to Production, Time Studies and Costs." His address was all too brief, but this was made up by the exhibit of a film illustrating operations in the company's plant. A good many members of the Chapter had the pleasure of a visit to the Durant works two years ago.

On the 20th the subject was "The Thirteen Period Calendar," which is not exactly a problem of the cost man, but which does affect all statistics and accounting, and is, therefore, of a great deal of interest. The speaker was Meredith N. Stiles, who substituted for M. B. Folson. Geo. Eastman, of the Eastman Kodak Company, Rochester, is taking a prominent part in the movement for calendar reform, and both Mr. Folson and Mr. Stiles are in the service of that company. For this address we are indebted to the aid of J. W. Spence, our member from the Canadian Kodak Company, which company, in conjunction with the Eastman Company, is using the new calendar for all its internal work.

The annual meeting of Toronto Chapter is to be held on March 6th at the regular meeting.

MONTREAL

A. S. Merrifield, Chief of the Cost Division of the Norton Company, Worcester, Mass., addressing the Montreal Chapter on Thursday, February 7th, outlined the cost system which their Company has developed over the many years since its original installation. Grinding wheels, the chief product of the Norton Company, are composed largely of products of aluminum clay, Bauxite, found in largest quantities in Bauxite, Arkansas. At the Arkansas plant the accounting system is comparatively simple, and the cost per ton of the calcined Bauxite is easily obtained. Further processes—at the ore plants, Niagara Falls, N.Y., and Chippawa, Ont.—carry the production to the preparation of "Alundum" or of "Crystallon," which are in turn shipped to the manufacturing plants, more notably the Central Plant at Worcester. The costing system at Worcester, developed to fit the special requirements of the industry, comprise several very interesting features. It has been found more practical to keep all factory books of record in the General Accounting Office, under the Administration Department. Records of the various sections are very finely divided and a large number of separate accounts and divisions are maintained. A continuous inventory of manufactured parts is in use, through which a check is established every time each specific article

is manufactured. All inventories are carefully controlled and seasonal physical qualities are considered in making purchases and shipments. Through the kindness of the Norton Company, the film "The Age of Speed" was exhibited. Showing the advantages of the present progressive and swiftly moving age over the easy-going times of our forefathers, the film carried through to the ways and means by which the great change has been made possible. The contribution to this process made by the grinding industry as instanced by the work of the Norton Company, was stressed, and an interesting survey was given of the various operations through which their materials must pass before they emerge as the finished products, ready for their part in carrying on the work of development.

Montreal passed in review before our Chapter at our meeting of February 21st, when Mr. G. E. Saint Pierre, K.C., Chief Advocate and Head of the Legal Department of the City, spoke on "The Municipal System of Montreal and its Departments." Mr. Saint Pierre covered in some detail the administrative structure of the City's management, showing the duties, functions and powers of the various groups. He pointed out that control is vested largely with the Executive Committee appointed from among the members of the Council, which Council consists of the Mayor and thirty-five Aldermen, all duly elected by vote of the citizens. The powers of the Mayor, the Executive Committee and the Council were mentioned in detail, and also the division of the City's activities into seven departments for administrative efficiency—law, health, public works, finance, police service, fire service, and the department of the City Clerk. The Budget, with its preparation, contents and effects, was discussed thoroughly. Estimated expenditures for the fiscal period, which, of course, must not exceed probable revenue, are prepared by department with all possible exactness. The largest sources of revenue are the various forms of taxes—real estate, school, paving, snow, business, water, special—but certain other income is derived from various contracts with individuals or corporations from licenses, and from numerous miscellaneous sources. Considerable discussion was necessary to settle definitely several involved points and was indulged in by a large number of our guests as well as our members.

The annual meeting of Montreal Chapter will be held on March 21, which is the date of a regular meeting.

WINNIPEG

The annual meeting of Winnipeg Chapter will be held on March 18th.